Tips for the Uberector by M dot Strange

Introduction

This text was taken from my A_BOOK, which is my full color book that documents the making of my newest film Heart String Marionette AND offers tons of "Making Of" information that you can't get anywhere else. So if you're interested in making your own animated feature films then I highly recommend picking up my A_BOOK. In the meantime I think this eBook will be helpful for anyone who wants to make their own films as well, so please feel free to share it with anyone who you think would be interested in it!

Thank you.

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Making of: HOW

In this section I'll give you an overview of my production process, as it's a little different from other workflows I've read about. This is my order of operations when making a film. I'll first discuss mostly technical details and then I'll discuss the "Whys".

Brainstorm:

I have a basic idea about what I'm going for with a few ideas for scenes and narrative hooks. I just write everything down and explore all possibilities without making any commitments to anything. At this point I really want to find the ROOT, as I've found there's a film in there that we THINK we want to make and there's another we HAVE to make. So I keep digging around in this brainstorming phase to find the real film buried amongst all the random ideas. In this phase I'll fill up notebooks with ideas and write chunks of narrative, hooks, situations and character ideas down on notecards, so I can flip through them and isolate the ones I like the most. So in this phase I'm trying to create an idea tornado, hoping that one of them will get so strong it will sweep me up and force me into the next phase. When I go into this phase I usually have a few vague ideas for films and maybe even some basic narratives worked out, but I try not to fall in love with any of them as to find the best amongst them. This phase will take a few weeks, as long as it takes to create that narrative typhoon to sweep me away!

Outline:

So after choosing a potential path, I then start to find/write the hooks or "epic" points in the film. It's usually the big reversals, shocking moments or battle scenes. I lay these out in linear order and experiment with different situations and different variables. I know that whatever goes on in this phase will most likely change, but my job at this point is to just do my best and push the process forwards. If you've ever seen the way a Katana is made, it's sort of like that. You keep heating the material, trying to break it down and tear it apart to find the weak spots. Then you fold it over examining it from all angles, while pounding away at it with a skeptics eye. You keep repeating this process until it's as tight and solid as it's going to be. Until a shot is rendered and finalized, it's still just a blueprint to me and could be changed at any time. So things are very flexible in this outlining phase. At this point I'll write and arrange the basic narrative and read it out in story form to different people to see if it catches and maintains theY interest. When reading, or "pitching", your story to a real live, non yes-man person it's easy to see the holes and weak points in the story, which you then fix before the next pitch. It's like testing out the performance more than it is seeking the person's approval. You can also change your story on the

fly whilst pitching and if it gets a good reaction from the person, you can consider it as a change. To me storytelling is storytelling. If you can't tell a good story face to face with another person then you'll never be able to do so in something as complex as an animated film. So I make my story and my hooks work in person before going any further. I used to have a little wacky band and we performed on the streets and in a few clubs here and there and that is INVALUABLE in giving you the ability to READ and PLAY TO an audience. There is a certain rhythm or pace that must be maintained as to not lose people, so I think that kind of public performance is a great exercise for storytellers. I've also been lucky enough to do a fair number of speaking engagements, one was with a crowd of over 2000 people. Those are also great storytelling practice. If you can keep a large audience entertained and interested with nothing more than your words then that can only help you as a filmmaker. Filmmakers have so many CHEATS at their disposal . The over the top emotionally manipulated music, the touching close ups with teary eyes, the best friend/child murdered with parent loved one reaction shot, etc. I believe we have to make it so we can get by WITHOUT these cheats at this outline phase. Don't depend on those cheats that will be coming later! Make your story work in outline form, because if you do it'll be that much MORE POWERFUL when you do turn those cheats on. I think most filmmakers don't really grind as hard as they should in pre-production, they depend on the actors or visual FX artists to bring the MAGIC. It's your job as WRITER to bring the MAGIC to the text, so don't move on from this outline phase unless the MAGIC is there.

Script:

   Up until this point you've been describing the actions and feelings of the characters, but now you actually get to step inside of them. This can be shocking at first because at this point they have no real thoughts or feelings. This is where you start to think and feel for them, this is where they start to react with each other. When I start out I'm writing what/how I think they are, but usually, halfway through the script, their real character will emerge and I'll find myself going back to change dialogue because once I KNOW the character I say to myself "They wouldn't say that!" So throughout the first draft you're thinking through a character. Then in subsequent drafts you're feeling through them, hopefully. Before I wrote HSM, I read a TON of screen writing and just general fiction writing books. I had read a few books on writing before HSM, but I had never really studied it in depth. Before HSM I'd written 50-70 short film scripts, a few feature scripts and a fair amount of fiction when I was younger. I never took any writing classes, let alone screenwriting, but after reading most everything I could find about it I've come to the conclusion that most all of it is HEARSAY and reverse engineered BULLSHIT. Look at the people who have written the so-called screenwriting "bibles". What great films have they written? NONE. That's right, NONE! They're just trying to make a BUCK. They took some great films and tried to reverse engineer them, tried to second guess the screenwriters after the fact. I looked at all my favorite films and NONE of them followed the rules or credos of the major screenwriting books. So it was good to read them, but I decided to go my own way. I've always done what's felt right

and not followed anyone else's rules and HSM was no different. The script for HSM probably went through about 60-70 revisions, if not more? I revised constantly, until the shot was actually animated and rendered. I view the script as a living thing, so it can evolve and grow throughout the production. To me it's just a blueprint, something to fall back on. If I come up with a better idea in the storyboarding, animatic or animation phase, I will edit the script accordingly. In its first draft HSM was a radically different film from what it ended up being in the end. There were three main characters who were cut out entirely. HSM started out as a tragic bi-sexual love triangle with monsters! It just had too many characters and too many narrative paths, so I decided to cut out those three and integrate their strongest characteristics or hooks into the remaining characters. So the first draft would have worked better as a mini-series instead of a single two hour film. The other three characters and theY stories were pretty cliche as well when it comes to Samurai film. They had my own spin on them of course and I liked them, so I'm considering animating their stories and including them on the HSM DVD.

Storyboard:

Where the pencil really meets the paper. So now we have the story in text form and hopefully it's as exciting and as powerful as it can be in WORDS. Hopefully you took your EMOTION and did your best to transmute it into TEXT. Now you turn on your inner visual poet, your master cinematographer/visual storyteller and transmute those WORDS into PICTURES. It's like you're still working on the Katana, you're still heating it, folding it over and pounding it to make it stronger, but now you add the visual layer of interpretation. In computing they have something called Abstraction Layer Theory. I believe the same sort of thing applies to filmmaking.

When I was a kid I wrote a lot of poetry and was very much a fan of playing with and manipulating words. I've been rapping since 2002 and I most definitely do enjoy playing with words when writing rhymes or freestyling, but I really feel like visual storytelling is my thing. I read a ton of manga and I think that it is the highest form of visual storytelling that exists today. I'm REALLY crazy about moving images though, so animation is my thing. When it gets to the storyboard phase I really get to have fun. I believe by reading manga, by watching good animation and good film, by being an active thinking photographer you build your visual vocabulary. When I storyboard I don't think, I FEEL. I don't think about what I'm trying to portray, I just draw what comes to mind. I'm not trying to come up with "clever shots" as I'm not trying to make clever films. I want to create emotionally authentic and powerful films, so I do less thinking and more feeling. I simply sit down with my storyboard sheets and a pencil, then get to drawing. We are limited in our expressions by our vocabulary when we're writing and in the same respect we are limited in our expression by our visual vocabulary when we're storyboarding. If all you know is master shot/shot/reverse shot, you're not going to be able to express much. You should have your own original authentic way of speaking VISUALLY. You can simply mimic others and copy visual phrases verbatim, stringing together copies, but you're just using other

peoples' words. You're doing visual karaoke. It may be fun, but it's not going to really move anyone.

When storyboarding HSM I went through and, in a linear fashion over the course of a few weeks, storyboarded the whole film, which was about 2300 crappy drawings of mine. THEN as I was about to animate each part of the film, I RE-STORYBOARDED each part. So I storyboarded the whole film twice. I did this to get the best out of it. I had to come up with better visual ideas after storyboarding it the first time AND I was dedicated to getting the best out of it. It was kinda funny too because after storyboarding the film the first time I had those storyboards velo-bound, like they were going to be the final visual bible or something. Little did I know that I was going to redo it all! I want no idle time when making a film. I use every second of my time to make the film better because I know you can't re-storyboard anything after it's done. So once I have the final storyboards, which I draw on templates I found by googling "storyboard wide" I then scan them in and use a Photoshop action to isolate them so I have a different png file for every frame. I import these png files into my NLE to create the animatic.

Animatic:

If ya ask me, when you make the animatic you ARE MAKING the film. It has imagery, dialogue and music. If what you want to happen isn't happening in the animatic, it's NOT going to happen in the final film no matter how awesome your visual FX are or how hawT yer actors are or how famous your voice actors are. Don't wait for someone or something else to bring the magic to the film, it's YOUR JOB to make the magic before anyone else shows up! It's easy to make a lot of excuses as to why the animatic is boring, but DON'T. Keep making changes until the animatic has the power and the magic. Even with my crappy drawings and cheesy temp voices the HSM animatic was epic to me. The emotion and drama is THERE, so anything added is just going to shine the diamond within. Your idea starts as coal in the brainstorming phase and through your constant pressure on it the diamond inside should be shining by the end of the scriptwriting phase. You should be shining that diamond all the way to the end! If you still have a lump of coal in the animatic phase, you need to go back as you didn't choose the right piece of carbon. With HSM I recorded all the temp voices for both the animatic and for the lip sync. So I had to act out every single character for the whole film. This REALLY gets you inside of your characters and the film. Expect massive edits to follow. I remember back before I made WATS I showed my brother the WATS animatic and he was laughing so hard, he was like "Just put this out! This is great!" It was funny because it was like these grand scenes, but rendered with my crappy drawings and me doing women's voices. Yet I could still see the potential, so I followed it!

The animatic phase is when TIME is introduced into the process and you get to play with tension/suspense. This is the first edit of the film. So, as rough as it might be, take it SERIOUSLY! One of the advantages of editing the animatic is that it's easy to kill babies, if you're familiar with the popular term by Walter Murch. Since you just have rough drawings,

instead of shiny 3d renders, you don't fall in love with the images. I've had this problem in the past. When you make everything yourself you're proud of yourself for just doing it, so you have a tendency to hold shiny shots way too long. Even including most them is probably an error IF they don't serve the story/mood. It's easy to be a merciless editor in the animatic phase, which I think is the advantage of doing animatics in the first place. You save production time, you save render time and you save your film from being a mediocre bore-fest that only appeals to other 3d artists as a really long demo reel.

Inventory:

Once the animatic is done I sit down and watch the animatic with a pad an paper and I make lists of all the things that I need to make for the film. I break it into four categories: Characters, props, sets and special FX. Having the animatic you now know what the camera will see, so you only add things to your list that will actually be seen by the camera. You also know how far you have to build the sets out. If the camera never goes behind a set, then you don't have to build that! So you're only going to model what you need to model! ALSO by having the animatic you know what objects will need to be functional and which ones are just for looks. It makes a big difference when modeling whether an object is functional or not, so this can save you a lot of time in the end. I haven't seen this described as a discrete stage in most productions, as it's usually lumped in with general pre-production. It's kind of depressing when you start this phase because you look at your list and depending on the grandiosity of your film it can be quite a lot! I had pages upon pages of things to model! It seemed a bit overwhelming at first, but then I broke it down like I do with everything and I just had to model 4-5 objects every day for a month or three.

Concept Art:

Now that I know what needs to be modeled, I sit down with my sketchbook and a pencil and systematically draw each of the objects. The first versions are usually not very inspiring so I continue to refine them. I was a bit surprised at how many of the initial concept drawings led to final models though. I end up drawing the main characters the most, as their look is the most important to me and they will be on screen most of the time. Strangely enough I only had to draw the sets once. I drew them once and those were the concepts used for what ended up being the final sets. The only characters that went through MANY iterations were Samhaine, The Body and The Strange Children, everything else stayed on course, for the most part, from the very first concept drawings. I'm not a skilled draftsman, but I'm able to get my design points across to myself and that's what's important, since I'm modeling it all. I drew a ton of references of the Masks, but didn't use any of them. I think I kind of channeled the Masks. Of course I was heavily inspired by Noh Masks, but what puzzled me after looking through tons of books and

literature about Noh is that the same Noh Mask archetypes are still in use. Zeami used these specific styled mask archetypes and they stayed that way. I do like the Noh Masks as they are, but I decided that if I was going to have a go at it I'd like to create my own looks for the Noh archetypes. My own demons, old man, old woman, etc. To make the Masks I just sculpted them with no(h) thoughts in my mind for 17 days or so in a row, then I attached the Masks to the matching archetypes and characters. I printed images of all the masks I had sculpted then I assigned an archetype to each one and that is how all the characters came to be.

Having the characters constructed as actual wooden Marionettes didn't come through in the concept art phase, that came in the rigging phase. I wasn't really thinking about poly counts and how I was going to rig the characters when doing the concept art. It was more about the style, the iconic values. I was always just OK with the character design UNTIL I decided to make them all be constructed as wooden Marionettes. That was the "AHA!" moment where it clicked and all came together. Once I did that, all the designs I thought were just ok really popped and worked. So I went through and drew all the objects with my modeling capabilities in mind. I'm not the greatest modeler in the world, nor do I want to be, and I didn't want to add unneeded detail to a model just because I could. I like the minimalist approach. I want the most powerful visual statement I can make with the simplest design. So I decided to bank everything on the Masks. I would have fairly simplistic, low poly bodies with very detailed, striking Masks. As we are looking at a character's face most of the time I thought this was the best strategy, ESPECIALLY given the influence of NOH in HSM. So in the end I went with template-based, low poly bodies, using unique textures to differentiate them and high poly detailed unique faces.

My approach to the design was this: Only use wood, stone, paper, metal and flesh and design things as if I was going to make them for a real stop motion film. So I wanted gritty, hand made, unique artifacts. I wanted characters that would leave people on the fence so they couldn't figure out by looking at them if they were "good" or "bad" I didn't want overly ornate things, I wanted the simple elegance of traditional Japanese design with the rawness and roughness of old school stopmo puppet films. I wanted Ninja Scroll taking place in a stopmotion Silent Hill. That's what I was going for. The final look is NOT EXACTLY what I was going for, it's actually BETTER than what I wanted and totally unique.

Modeling:

Once the construction list is finished I move on to modeling it all. This was the first project I had ever used Zbrush on and I can say now that without Zbrush I would not have been able to make HSM! I had always struggled with organic modeling and that's what Zbrush was made to do. Zbrush is a much more natural and easy way for me to create 3d objects, so I tried to use it as much as possible. When modeling objects I would always try to do it with Zbrush first. I used Zspheres extensively and I found them really intuitive and fast. So if you're struggling with traditional poly modeling techniques give Zbrush, Scuptiris of Mudbox a try. All the Masks, Monsters and many of the objects in the film were made in Zbrush, with further additions and

textures done with Cinema 4d and its Bodypaint module. I wanted a handmade look to the objects in this film and when combining objects sculpted in Zbrush with an Intuos by hand, then painting the same objects "by hand" in Bodypaint, you really get the rough imperfections that I love about real handmade objects. I only used "real" textures, as well. That is to say things like wood, metal, paper and flesh, most of which I made by scanning real objects or taking photos of them which I later Photoshopped. Actually the Monster skins used in the film came from the skins of the real stopmotion puppets from WATS. The stopmo monsters in WATS were made by painting layers of liquid latex over the armatures and painting them. Since the WATS monsters are at the bottom of a box next to my bed I just scanned them in and then tiled the texture samples with Photoshop. After that I brought those tiled textures into Crazybump and created displacement, normal, bump and diffusion maps out of them and applied them to the 3d Monsters in HSM. This pushed the handmade look even further. I use 3d animation because I have no other affordable way of realizing my big ideas, but you could say that with HSM I approached it as if I was making an epic stopmotion film. That's how I wanted it to look, so I modeled and textured things accordingly. The paper mache/damaged, old, painted wood look of most of the characters came through in much of the same way. My lovely assistant found an old French book about Marionettes and mailed it to me. It had these awesome old black and white photos of Marionettes used in Puppet Shows from the 1950s, so I scanned the more detailed photos and used Photoshop and Crazybump to capture the 3d textures of those old Marionettes. I then applied the displacement/bump/normal map to my "handmade" 3d Marionettes. When painting the textures on my characters with Bodypaint's projection mode I made sure to be rough and messy. I can't stand the shiny perfect look of a lot of popular 3d animation. It doesn't have enough grit or texture for my liking. It's lacking the imperfection and grime that make real objects unique artifacts. I wanted my models to look like they were made by hand in Prague or in a Toho Kaiju workshop, not like plastic toys made on a Chinese assembly line.

For the buildings and other objects that had repetitive structures I used Cinema 4d's Mograph module. It allows you to build, replicate and offset intricate structures really quickly, so I leveraged its power whenever possible. Mograph really puts a lot of power in a single artist's hands and EVERYTHING you make with it is live and procedural. So anything you make with Mograph, like a bridge or a gate, can be modified at any time or destroyed with all of it's separate pieces becoming dynamic. I also used Mograph for my poor man's massive, but I'll discuss that in the animation section. I don't know the exact number, but I probably modeled around 200 different objects for HSM. I used Cinema 4d's content browser to manage and organize all of them. I kept the objects in several categories in the content browser: Characters, Masks, props, interior objects, Sets, exterior objects, other/special FX.

Layout:

Once everything has been modeled, in the construction phase my job is to lay it all out. To put the sets together and fill them all out with props and the like. Again, this is all based on the

animatic as I know from what angle each set will be photographed from, so I keep this in mind when laying out the sets. I fill out the sets in the layout phase. So I'll have hills, stones and trees as separate objects which I put together in the layout phase. I focus on the areas where the action takes place, adding the most detail there and filling out the rest. There were a few C4d plugins that sped up the process a lot. One of them was the Paint on Surface plugin. With this plugin you can take an object, or a hierarchy of objects, and paint them onto the surface of geometry, for example trees, and rocks on a hillside or books and debris on the ground. The plugin can randomize the position/rotation/scale for greater realism. I also used the Surface Spread plugin as this plugin was made to populate landscapes with objects and you can even make your hills/ mountains with it. So you would model your trees and rocks, etc. and then use Surface Spread to randomly place them on your landscape, with tons of controls to randomize the look or control the dispersion of said objects based on altitude and a number of other variables. So I was able to fill out the sets rather quickly. Of course I had to also place many of the objects by hand for greater precision. With my concept art and the animatic as a guide it was a quick process. As I'm going through the layout process I'm constantly checking angles and setups by looking for various 3d cameras in the scene. I tend to use only 10mm, 15mm, 24mm, 50mm, 80mm and 300mm lenses when setting up shots. So I check the sets in progress with the common lenses to make sure things are as they should be, but, since I have ultimate control of the sets in the 3d, if there is a problem wherein something doesn't fit or work out as it should I just move walls or whatever else it takes to make the shot work.

When laying the sets out I fill out and detail the parts of the scene that will be featured in most of the shots, then I expand them and detail the far off regions. If it's not too much trouble I'll go ahead and fill out the entire set, all the way around. I've had some ideas about releasing the sets as explorable 3d environments, so they'll have to be complete to do that. When I was laying the sets out I had the temptation to light them as well, but I've learned that I work better when I focus on a specific task all the way through, rather than constantly shifting gears. So I went through and laid out all the sets for the whole film, then made lighting a separate work pass. To me filmmaking is a simple process of breaking down complex processes into smaller more manageable ones, making quotas and just grinding every day to complete the tasks you need to do. In the past I didn't have separate modeling, layout, and lighting phases, so my productions were much less efficient. Your sets and geometry can take on an entirely different appearance when lit, but again I don't want to have to lean on a later process and settle for mediocrity in the current phase, so I make sure I grind until whatever I'm working on is at it's best for that phase. To be this thorough with each phase you really just need more time. When you're working on your own, with no definite deadlines but your own internal ones, I think you should take as much time as you need to really get the best out of the current phase, WHILST staying on a moderately aggressive schedule so you don't take ten years to complete the project.

Lighting:

Something else I learned with the HSM production was not to try to color the sets until I got to the lighting phase, so with the set design and character design I limited the color palettes, keeping it mostly grayscale through using a lot of desaturation. So when creating the characters and props and laying out the sets it was kinda discouraging because everything was so grey, lacking color and vitality. I learned this was the best thing I could have done, since there weren't any colors on the objects to screw up the lighting color schemes, I could use colored lights to color the sets and the scenes. I guess it's sort of like a theater approach wherein they use their multicolored lights to color the sets and add mood. So by the time I got to the lighting phase I could set the color scheme with no interference from the sets and characters. My approach to the lighting was to only use natural light. I wanted to make it so the only lighting sources in the film would be the moon, flames and candles. As such I had these mostly greyscale sets that I would color with blue, reddish orange and yellow lights. It's really simple yet I was making things overly complex in the past by coloring my characters and sets, so by the time I got to lighting the colors in the lights fought with the colors in the characters and sets, which led to a lot of muddiness OR the need to lay a certain hue over the whole image to force things to comply. This approach worked in my earlier works, but I wanted a more elegant and refined look with HSM.

When I lit the sets I started with darkness, of course, then I would add in the main hard light sources in the scene, usually in the form of fire or candles. I used a mixture of volumetric and visible lights. Then I added a little Xpresso to make the lights flicker at different rates to simulate real flames. So in the setups I would have a volumetric omni and several non-visible spot lights to give me greater control over the illumination of the key objects in the scene. So it's like I was doing my own virtual GI, setting up my own bounces and the like. I believe that REAL MEN DON'T USE GI! GI looks great, but it's less of the artist and more of the algorithms. Since I'm trying to create UNIQUE work in every way and stand out from the rest, I stay away from tools and techniques that don't really rely on a human artist's skill and ability. Certain renderers' GI have their own look and I want MY OWN LOOK, so I stay away from automated solutions so I can stand out in every way possible.

The role of lighting is to frame the set and the important objects in the set and to color the scene, adding the mood and atmosphere. For the atmosphere I create several huge atmospheric spot lights with animated noise in their visibility and criss crossed them in the background of the sets to create layers of foggy looking light, receding into the backgrounds. Fog is something that's really tough to do right in 3d while keeping render times reasonable. I experimented with a few different ways before finalizing my technique. I ended using a mix of volumetric lights in the 3d scene, with layers of real fog added in post using a depth pass as a track matte. Cinema 4d's visible lights can go a long way toward getting realistic fog with low render times, but I found the touches that really sold the look came in the compositing phase.

I have a fair amount of experience lighting sets in the real world from my stopmotion and live action experience. I always sort of knew what I wanted with my lighting setups when doing stopmotion, but was never really able to get with the lack of control in real life. Light leakage, light pollution, things like that can screw things up, but in 3d you have TOTAL control and can even make it so lights only illuminate specific objects or nothing at all. So I used these "hacks" to get the looks I wanted in every set. It was almost like magic! I was so used to have my lighting turn into a muddy mess, but with this new approach most of it looked pretty great in 3d, although I did heavily tweak and enhance the lighting in the compositing phase. When all the set lighting was finished I rendered out fly-throughs of all the sets to make sure there wasn't any funny business with the lighting/textures. That's when I learned that like an idiot I set most all of the texture interpolation to "alias" which looks fine for still frames, which I had been working with up to this point, but causes flickering when animated. So I had to go through pretty much every texture used and switch them over to "mip".

Character Rigging/Skinning:

So after all the sets were lit and finaled I took a 2 week vacation, but my job on this "vacation" was to create the master rig for all the characters. I never really understood the process of rigging/skinning and my past rigs had been rubbish. I was lucky whenever they worked, but most of the time they didn't and they had severely limited range of motion because of my clueless, crappy setup. This time I was determined to truly understand the process and make a good solid and light rig. I used the Cactus Dan Pro Character bundle for my rigging/skinning/morphs and LUCKY FOR ME Cactus Dan created a free 4 hour video tutorial series on how to rig with his tools. So I took my laptop and these tutorials with me on vacation, DETERMINED to not settle for a rig I didn't know how to use. So I sat down with my notebook and watched his tutorials and took notes and after about a week I had made the best rig I had ever made in my life! It became the master rig for all the characters in HSM. I never saw the point of creating a unique rig for each character?! If I had one good stable rig, why not use that for all of them? So that's what I did. I wanted the FEWEST amount of controls I could have on my rig. I wasn't out to make the most amazing animation ever and I didn't want it all exaggerated and cartoony either, I wanted them to move like real Marionettes. This allowed my rig to be really fast and easy to animate and since I used the same one for the whole film, I quickly learned its quirks if any and was able to animate really fast. Another advantage of using the same rig for all the characters was that I could utilize Cinema 4d's motion clip system, sharing clips between all the characters.

After I finished the rig I skinned one to the Samhaine character. This was the early version of Samhaine, wherein his whole body was the same mesh. I wanted a rough low poly look, so the model was rough and low poly. It looked ok when still, but I learned some things when trying to skin it. I found that the limbs didn't articulate properly without me adding more loops, which increased the poly count, which slowed the rig down. It also brought another problem to light for

me. I had textured them and envisioned them as being made out of wood, but wood doesn't bend that much, so it was wrong in more ways than one. So then I got the idea to go with segmented characters. I went and grabbed a bunch of reference photos, I even got an old woodworking book from the 50s off of ebay as it had detailed instructions on how to construct a real segmented wooden Marionette. I also found an old wooden Pinocchio Puppet design that the animators made as a reference for themselves when making that film. I took all my reference and studied a few different ways wooden Marionettes were constructed. I made three different prototypes based on three different real Marionette designs, one of which can be seen as the automaton that walks through a few scenes in the film. I liked the look of that one, but thought it would cause too many problems when swinging swords and the like. I thought a ball joint design would be the best. So the ball joint design I made ended up being the one I used.

Another advantage to the segmented body design was that I wouldn't have to skin anything, so that meant faster feedback when animating the character, no surprise bad deformations. I used constraints to attach the segmented body parts to the rig. The great part about this is that you can easily adjust the placement of the parts and even swap the parts out. For the Monsters that didn't have segmented bodies that I could attach via constraints, I just scaled up the master rig to fit the Monster's body parts and then skinned the mesh. Having the skeleton pre-rigged saves so much time when skinning it and you know the rig works, so you won't get any ruined geometry from flipped poles and things like that. Much to my surprise after making this master rig the process of rigging/skinning was really fast and easy on HSM.

Animation:

For some reason animation always terrifies me when I first start out on a project, especially a feature length project. I do love animation, but I see myself more as a "director" that animates, rather than an "animator" that directs. So again, I do love and appreciate the art of animation very much, but when doing everything myself I can't spend as much time animating a shot compared to someone who is just working as an animator. So I have a sort of inferiority complex when it comes to animating. On HSM I was able to shake it because on the few shots that I spent a lot of time on I was surprised with the high quality I was able to produce. Having said that I treat my projects more like live action than conventional 3d animation. I treat animation like a medium, NOT a genre. I don't watch animated films because everything is SO ANIMATED for no real reason other than to call attention to itself. I've watched all the animation I could find so I'm not very interested in technique alone, I'm looking for something more.

To get over my innate fear of not being good enough when animating I took a month just to practice with a basic soldier character so I could get used to the rig and feel out the style I was to produce the film in. My initial thought was to mimic the stopmotion process and use only hold keyframes. After doing some tests with this straight ahead, zero interpolation style I thought that it would probably get annoying after awhile so I abandoned it, EXCEPT for a few instances with Samhaine. I was also very interested in getting a jittery organic look, without having to manually

key every IK controller on every frame or two. I tried a few different things, like animating a shot with hold keys, then using C4d's mouse mocap "Cappuchino" tool to add organic random motion, but it was too chaotic. What I ended up doing was animating the characters with normal spline interpolation, then adding vibrate tags with really low settings for a little random organic motion. You can really see this technique at work with the Kid character or whenever a character is supposed to be scared. I kept testing different techniques throughout the month until I settled on something that looked good and was relatively quick work as well. I'll share some of those early tests and clips on the HSM DVD.

I used pose 2 pose animation for most all of the film, with straight ahead styles during action shots. Swordplay especially seems to benefit from FK and straight ahead animation. I tried to use motion clips whenever I could, especially with repetitive movements like walks and runs. During my month of animation practice I went through each character and created theY runs and walks, then saved them as motion clips and I actually used many of them in the film. None of the walk or run cycles were perfect, but I don't watch films for their great run/walk cycles as it's just something that's required to get a character from point A to point B and if we don't have to see that at all, all the better.

Since I started with stopmotion animation I had to adjust to 3d animation. I'm not saying I was the greatest stopmotion animater, because I'm not. I just did enough to tell my story. But when you're used to doing stopmotion I've found that you learn the FEEL of certain movements, like when animating a run cycle you know the feel of how the knee whips through and locks when the foot makes contact with the floor. None of this "feel" comes over to 3d animation because you have to know how a certain motion LOOKS. I think the transition from 2d animation to 3d animation would be much more natural. In the end I love 3d animation more than stopmotion with its blasted gravity and flickering lights and shadows?! Timing is timing though and the more of any type of animation you do helps your sense of timing.

So when animating shots for HSM I would first bring the characters into the scene and pose them wherever they would be for most of the shot. Then I would set the camera up and animate it if it was moving through the shot. Animating the camera first can save time because your character might be out of shot for an amount of time, so why animate them when they are not visible? Once the camera is animated, I then animate the first character if there is more than one in the shot. I will then animate the second, third, etc. Once the shot is animated I will then do a test render to test the lighting and I usually have to add some additional lights to highlight or frame the character in a better way. My approach to this would be to simply find any nearby "physical" lights in the scene, so torches, candles, etc. then duplicate or create a spot light based on it's lights and point them at the character as a key light, then I would create a bluish moon to act as a fill or backlight. Once the shot was looking good I'd setup the depth of field buffer I wanted. I use the plugin Z-Blur for Cinema 4d, as it gives good visual feedback and lots of additional controls for depth passes, which I used for much more than DOF blurring when I got to the compositing phase. Once a shot was finaled I'd send it off to the render server and work on the next. Something that helped me a lot with the visual flow of the film was that whenever a

shot was finished I would render a still from it and add it to an album in Adobe Bridge. It was like an after the fact storyboard, so I had stills for every shot in the film as I built it. They were numbered to match the shots, so later in the film if I wanted to reuse an animation, set or asset I would just go into Bridge and look through the sequences and find the shot I wanted. I would then just open the Cinema 4d file for that shot and get what I needed out of that. I used the sequence method to organize everything. Here's some shots of my 3d project file and 3d render folders:

A lot of people ask me about my workflow when animating or for some organizational tips. Well with this making of section I'm showing you my order of operations. As far as breaking work down my approach is simple. I make my films in linear order. I figure that I'm going to get better as I go on and the quality of the film should get better as you go further, so I think that's a good thing. As far as getting shots done, all I do is count the number of shots there is to do based on the animatic/storyboard. Then I estimate, based on past experience and render tests with the new sets/characters, how many shots I'm able to complete in a day. For HSM I looked at the last month of production for WATS. It was mostly all 3d and probably the highest quality stuff in the film and I did about 240 shots in one month, so I knew I could do 150-200 shots a month without dying, whilst keeping a decent level of quality and reasonable render times. So I just create daily quotas and fight to stay with them. Once the quotas are created, it's just a daily war between me and them. Some days I can barely reach them, some days I do 3-4x the quota. I think the most shots I did in a month for HSM was about 220 sometime in the middle of production. It's a pretty simple approach. Just figure out how long you want to spend in production then divide that by the number of shots and that's what you have to do a day. Use your past production experience and recent tests as reference then GO TO WAR!

Rendering:

There was no separate rendering phase as I rendered as I went along. So as I finished animating a shot I sent it off to render as my little render farm ran 24/7 and was able to keep up with my output. To make editing simpler and more manageable I broke the film into 45 sequences based on location changes. So as soon as I finished animating a sequence and the 3d renders were done, I would import the 3d renders into After Effects and render out quicktime movies. If there were any errors I would fix them and re-render them, then once they were all fixed I would move on. These render fixes were minor so I would complete them all in a day or two, which is the time I gave myself anyway in between sequence to re-storyboard and prep for the next sequence. So at the start of a month I would re-storyboard the sequences that were to be done that month as well as create any additional 3d props that I added in during the new storyboards. I would record the temp voiceovers required for lip sync in that sequence as well. I would then be ready to work. I rendered to EXR sequences at 1920x802 24fps. For most shots I only rendered out an RGBA pass and a depth pass. Some special FX needed object buffers as well and whenever I had something important in the foreground, that was going to be out of

focus in front of something that was in focus, I had to render out separate foreground and background layers as post DOF has its limitations when it comes to that. If I was going to do it again I would have rendered out material luminance and visible light as separate passes as well. I didn't do this at first as pass management was a pain because C4d can't render multilayer EXRs and I hadn't discovered the great Immigration script for After Effects at that point. Now that I use Immigration having a ton of passes doesn't make project/file management any more complicated or time consuming.

I didn't tweak out over minor render problems like texture flicker on objects in the background as I knew I was going to add noise/grain and layers of dust in the compositing phase. I know some 3d artists go nuts over all these minor artifacts, but I believe that if your average viewer even notices that stuff then you failed in your job as a filmmaker because the story, mood and characters should be occupying their attention.

Compositing:

I did all the compositing in Adobe After Effects Cs5. One of the great things you get when working with Cinema 4d and After Effects is the amazing integration between the two. For every C4d render, you can render out an After Effects project that contains your 3d camera, lights and even 3d nulls for objects you choose. I choose to do my skies in the compositing phase as I have greater control over the look of the atmosphere, so for very shot that needed a sky I added a spot light with its intensity set to %0. It had a "look at camera" expression on it and I positioned it in the background of the scene where the sky would be. So then in After Effects all I had to do was replace that light with my matte painting and the sky/clouds, etc. were locked into the shot. I did my best and would not stop tweaking with my 3d renders until I thought they looked awesome straight out of the 3d render. After comping a few of these shots I realized that what I thought was "awesome" out of the 3d render looked like crap compared to the final image after I tweaked it in After Effects. This was an exciting discovery to make!

Something new I did with HSM was the use of matte paintings. When I made WATS I just had 2d sky layers that I dropped behind the shots, but I didn't have any set extensions, mountains, etc. With WATS it worked out as all the ground was totally flat, but with HSM I went for a little more realistic terrain. So in the prep phase for the compositing I went through and made all the matte paintings for all of the sets. I made the matte paintings in Photoshop by using 3d still elements rendered from C4d, such as mountains with trees, etc. Once the rough still matte paintings were done in Photoshop I imported them into After Effects and since all the layers were intact I added animated elements and video to the matte paintings in After Effects. For example the Photoshop matte paintings would have the basic landscape, then in After Effects I would add in layers of animated fog, video of small fires burning on the hills and video of twinkling stars in the background. I kept these completed matte paintings as After Effects comps to keep my shot comps clean.

Once all the matte paintings were completed I went through and composited the film in order, sequence by sequence. An average shot would have about 12-15 layers. I used the depth passes to not only apply DOF blur in the appropriate shots but I also used them to apply a layer of live action dust in the scenes so it would have a natural falloff. I used the same technique to add practical fog when required as well. To get all the beautiful depth of field blurring and bokeh I used the Frischluft Lenscare plugin. It's simply the best DOF blur plugin for After Effects. I also did motion blur in post with Reelsmart Motion Blur. I didn't use motion vectors as the version of C4d I used had a bug when using motion vector passes with Subpolygon displacement. All of my characters used SPD as they were low poly meshes from Zbrush with SPD applied at render time, to push them back to the 9million+ poly quality created in Zbrush. On top of all of my comps was an adjustment layer with Red Giant Magic Bullet Looks, I created all my own diffusion heavy looks that I used on the film. Magic Bullet Looks is an AWESOME tool to create the final look for your film.

I ended up doing a lot of heavy secondary color correction on most shots with visible light in them because the post process I used sucked all the volume out of the volumetric lights in the 3d renders. To get the light volume back I created heavily feathered solids, colored to match the lights and applied them to the scene using the add transfer mode. Since I was working with EXRs in 32bpc mode the solids looked like realistic volumetric light. If for some reason the color scheme in the 3d scene was horrible I would desaturate the whole shot and then add color back in using these colored solids. It actually worked out quite well and gave it a very soft, painterly look that I really liked. You can see the results in the Cerealis scenes.

The look I was really aiming to get in post was a soft, dreamy look. Something akin to a dream about some weird puppet show. I didn't want it to look hard and perfect like most 3d and I wasn't going for realism either. I wanted a soft fantasy look with a life of its own and I got pretty close to what I was going for. Like with anything else you just have to keep getting reference and keep grinding to get closer to that reference. I used photos of real Marionette shows, Noh theater and stills from some of my favorite looking films like "Escape from New York", "Legend" and "Kwaidan" as reference. Games from the "Silent Hill", "Resident Evil" and "Fatal Frame" series were a major inspiration and reference as well.

I'm a big fan of copy-paste solutions and since I created the shots in order and had them organized by set all the shots from a specific sequence had the same look, so if I applied the same post look to them all they would all match. So when I was compositing I would work hard to get the look right for the first few shots and then just copy-paste the adjustment layers with the looks applied to all the rest of the shots. Same goes for the level/hue adjustments to each RGBA layer for every shot. This template/copy-paste method helped me speed through compositing. I was able to composite all 1660 shots in less than 2 months. Of course certain shots had their own set of specific problems, so I would have to spend extra time tweaking on those. I didn't render the composited shots as I went along like I did with the 3d renders, instead I waited until I was about halfway through compositing to start rendering shots overnight. I learned a valuable lesson on WATS wherein as I went further with the compositing I would learn new techniques or tricks

later on that I wanted to apply to the earlier shots. On WATS I rendered as I went along, so I ended up rendering the same sequences 3-4 times wasting a lot of time and disk space. So on HSM I waited 'til I felt like I had worked out all the tricks and only THEN did I start the renders and that worked out for the most part. Later in the film I found I really liked a heavy diffusion look and the shots earlier in the film were a bit harder, but I didn't feel like it detracted from the film so I didn't go back to change them. I feel that it actually made it feel like you were going deeper and deeper into a dream. That's actually what it feels like for me when I'm working on a film. I start out in reality where things are not so tite, but over time I fall deeper and deeper into the dream and then it's magical. Compositing is definitely what brings out the dreaminess.

Editing:

I took a different approach from what I've done before when editing HSM. With HSM I was working with a composer whose work I greatly admire and respect, so he and I decided that he would not traditionally score to picture. All throughout pre-production the composer Endika and I would discuss the script to make sure we were on the same page. He created his own sort of emotional script based on my script. We discussed the two to make sure the important emotional moments were all included in his script. Once we agreed he went off and wrote the music based on his emotional script, knowing that I would not ask him to change him. We made an agreement that I would treat the music as law when it came to the editing phase, which I did. I know that music has its own natural flow and by asking a composer to score to picture you are disrupting that flow. You are not allowing it to be in its natural state at all so it's like fake, forced music. I didn't want that and I knew Endika wouldn't want to do that either. I'm always interested in trying new things, in experimenting, so this was a new experiment. As opposed to my sequences, Endika created the music in movements, so I edited the film based on these movements. My sequences were based on location changes and his movements were based on the major emotional breaks in the film as dictated by his music. So editing was pretty simple for me as I didn't have much room to wiggle. The music was my template and law so I followed it.

Endika's interpretation brought some interesting things to the film as I envisioned much of it to be cold, dark, serious and ruthless. Instead of creating music that "fit" the mood that I was pushing, he created very warm, touching music with a slightly comical edge. It's almost as if it wasn't allowing the film to take itself too seriously and with all the comedy I wrote in I think it makes the film better in the end. When Endika gave me the music for each sequence he gave me timecode cues that let me know when a certain important event was taking place, so the first thing I did when editing a movement was to drop the matching shots in on those cue points. It actually made it more fun to edit this way as I had points throughout the edit that I couldn't move, so I had to stretch and compress the stuff around it to work out. I don't think much when I'm editing, I just go with what feels right so editing this way seems very natural.

I edited the film with Adobe Premiere Pro Cs5. It has great integration with After Effects which allowed me to save time because I didn't have to render my edited sequences to get them

back into After Effects for final output. As far as editing software goes it's all the same to me as long as it can cut. What makes the difference is its ability to integrate with other applications and its import/export capabilities. As far as the process of editing, I didn't do anything different than normal with HSM except I had the revelation that a film is a bunch of cool shots I made strung together. It has nothing to do with me and everything to do with doing ANYTHING to make the film the best it can be as a standalone presentation. When you create everything on your own you get this sense of pride and ownership over your shots that can be detrimental when editing. I had no qualms with killing my babies on HSM.

There were a few scenes I had animated in the film that I had to cut out because they didn't fit when following Endika's score. So instead of asking him to change the music or forcing them in I just cut them out. I'm sure they'll show up on the HSM DVD though. So editing was fast and straight forward for me. No regrets, no redoing, just following the law of the music and going with the flow.

Music is the life glue without which you will never know the poet inside of you.

Final thoughts: I know it's sort of difficult to discuss the making of an animated film with words and that it is easier to understand through video tutorials and the like. I will be producing some in depth video tutorials and walkthroughs based on HSM. They will either appear on the HSM DVD or on a separate making-of DVD.

WORKFLOW

Workflow is something I think a lot about and plan, without really realizing it, since there is no disconnect from my regular life and my film production life, as I tend to approach it all the same way. Success, time and time again, has to do with planning. If you don't properly plan, your chance of succeeding drops significantly. On a short project you can get away with not planning, but on a long form heavy project, like an animated feature film, a lack of proper planning = failure. Stanley Kubrick said something to the effect that filmmaking was just a succession of problem solving or something like that and if you can't work out a good way to solve problems, then you can't make a film. I mean from the start it's all about problem solving.

Problem #1= I want to make a film but I don't have an idea.

Solution= Come up with an idea. If that's too big of a task break it down into smaller, more manageable tasks.

That's what its all about to me and it just makes sense. Making a short film is like eating a small cheeseburger. Yeh maybe you could eat it in two bites or less and get away with it, you could also do it in large bites, but if you are making an animated feature film and not planning properly, that's like trying to eat a moose in one bite. YOU'RE GOING TO DIE! You're going to choke to death or not even try to eat it, since it's so overwhelming a task when faced with it as a whole. Through your workflow you break your film down into manageable pieces that you can

complete without choking to death or dying. Those small pieces aren't that intimidating either. When I was a kid I saw a segment on the TV show "That's incredible", where a guy ate an entire bicycle. He did so by cutting the bicycle into tiny pieces the size of a dime. There were hundreds of pieces, but he just ate one or two a day for a year and then he was done. THAT is how you should approach developing the workflow for your project.

Just like with eating, if you eat too much and gorge yourself, odds are you'll get sick and won't be able to do much for awhile. Equate that to burnout. Very often people will try to complete a huge project in one go, they gorge themselves and get sick, they burnout and fail. You want to make it so you can keep eating manageable amounts every day for prolonged periods of time.

So production planning is a very logical and simple thing to me and I use the same approach in all aspects of my life. It's all about longevity, focus and consistency.

My order of operations or workflow is explained in detail in the "making of" chapter of this book, but I'll outline it again here. It's based on this "bite sized" approach.

Brainstorm--> Outline--> Script--> Storyboard--> Animatic--> Inventory--> Concept art--> Modeling--> Layout--> Lighting--> Rigging/Char setup--> Animation--> Rendering--> Compositing/Color Correction--> Editing

Something I didn't talk about in the "making of" section is the prep and error correction part of some of the phases. So, for example, in the animation phase, once I finished animating a sequence and that sequence finished rendering, I would render out temp movies to watch for all the shots in that sequence. I would make notes of any errors, then correct and re-render those before moving on to the next sequence. I should probably write a bit more about the sequence approach as well.

Sequence Approach:

So the film as a whole is a huge undertaking. Tons of shots and tons of sets, so I first break the film down based on the sets/locations. I know from experience that once a set is lit and ready to go, it's easy to keep working in that set rather than to leave it and move to another, just to have to come back later. So HSM starts in the "Nether World" set and that is Sequence 1, then it moves to "Wor Manor" and that is Sequence 2, and so on and so forth. I come back to those sets later in the film, but those are different Sequences. I guess it would be convenient to group all the shots in a set to the same sequence, but I have a different approach. I make my films in linear order because I know I will get better as I go along and I want the film to get better as you watch it. So I will always make them in order.

So HSM was broken into 45 sequences, based on location changes. I would look at each month and figure out which sequences I would complete each month. How do you figure that out? Through testing for one thing. Animate and complete some test shots at the level of quality you want to achieve, work at the level of intensity you want to do for the film and also spend the

amount of time on it that you know you'll have to give to the project on a daily basis. Once you've done this, it will give you a good idea of how many shots you can complete in a day. Then use this estimation to figure out your desired daily quota. Let's say you know you can go 5 shots a day and Sequence 1 is 45 shots. You can make a pretty accurate guess now, that Sequence 1 will take 9 days, but based on experience you know that delays happen, so add another day or two. So give yourself 11 days to complete said Sequence. When looking at the big picture you have to figure out how much time you want to spend working on the film. So at the level of quality you're happy with, you determine it's going to take you 5 years just to animate the film and that's too much for you. You either have to decrease the quality of animation to decrease the time spent or shorten the film. My goal for HSM was to animate all 1600 shots in 12 months, which I ended up doing in 11 months. If you're giving yourself an unlimited amount of time to complete your film, you don't have to worry about quotas, BUT ALL MY WORK IS BASED AROUND DAILY QUOTAS.

Quotas:

You can use quotas for everything. Number of script pages you must write per day, how many storyboard frames to draw per day, how many models to model per day, how many shots to animate per day, how many shots to composite per day, etc. It's these daily bite sized pieces that will allow you to complete HUGE projects on your own without dying. The key is to break the entire process down. Once you do, it sort of sucks the magic out, which many creative people seem to need to feel to get work done. When you get down to it, though, there's not much magic to the process of actually making the film. It's a daily grind and you're a little factory, an assembly line. That's the way it is. The thing that keeps you inspired is knowing that if you keep this up over time, you will have that magickal thing you envisioned at the very beginning.

I've found a lot of creative or artsy people have a problem with this process. They are used to getting a spark of inspiration, then going off and completing the work with that inspiration. As soon as that initial spark of inspiration dies, so does their work ethic. I'm here to say that this way of working is very amateurish. You want to be a professional! A BIG help for my turning professional and getting the job done was the book "THE WAR OF ART" by Steven Pressfield. Go read it now! Most Artists/Creatives have a very amateurish approach. They don't look at it like what it really is, which is WORK. The work is fun sometimes, but it's also very agonizing and boring at times. So will you quit like a weak willed amateur in those times or will you persevere and power through it like a professional?

Breakdowns:

I break each month down, so that I know which sequences I'm completing and I also have to work in a few extra days for prep work and for error correction. So the first 1-3 days of the

month are attributed to prep work for the sequence to animate. This includes recording the temp voices required for lip sync, re-storyboarding the sequences if necessary, creating any additional models required for the shots added in the new storyboards, if any, as well as creating the necessary file/folder structure for that month's work. You want to make your file structure in a logical way so that finding files is effortless, so you want to use the same file/folder structure every month. Take some time before you start and figure out the best way, then stick to it. I draw workflow diagrams on paper to work it out and then I do some test work to see if I missed anything. Try to consider what you'll have to do in post as well when working out the file/folder structure. I made an error in HSM when I made my sequence folders for animating. For a given shot in Sequence 1 this is that the file structure looked like :

My media drive:/Sequences/Sequence01/Shot0001/Audio/0001.aif

That worked fine when animating, because to load the audio I just had to navigate to the folder where the 3d project file was saved and go into the audio folder. However when I got to edit phase, to get the audio files out I had to go through each shot folder one by one to extract said audio files to use in the temp edit. So the hierarchy should have been like this:

My media drive:/Sequences/Sequence01/Audio/

So at the root of my SequenceXX folders, I should have had a folder called "Audio" to go along with all the Shot folders, so that when I got to the edit I could have just imported the contents of that audio folder into my editing program. The reason I had shot folders, instead of just saving the 3d files in that directory, was that I would often save variations of a shot like "Shot0001a_redo" and the like, so it would have made a mess of that directory.

This is why you do run-throughs and tests to work as many of these kinks as possible out, BEFORE you go into production and have the pressure of your quota hanging over you. Granted you can't work ALL the potential problems out and you could also just stay in this testing phase forever. It's easy to get into the fear and testing cycle that never ends. Once you've done a fair amount of testing you just have to GO FOR IT. If you've ever seen a race in track and watched the sprinters take their marks, set their feet, then stand up and do it again a few times, constantly getting set, those runners have a gun going BANG to let them know its time to GO, but we have no such gun and many people get STUCK readjusting their feet forever. I've known people who wanted to make a film or whatever, yet they never got out of the testing or research phase so they don't want to ever do it. You'll NEVER feel 100% ready, there is always going to be some doubts, but you have to go anyway because IT IS A RACE. If you're an filmmaker you're competing with every other filmmaker in the entire world! Whilst you're standing still, constantly re-adjusting your feet, some other filmmaker's already lapped you a few times and by the time you decide to go the race is over. It's like WATS was FAR from perfect, but what would have happened if I had hesitated or had taken forever and released it in 2011 instead of 2007? The mainstream has already done 8bit/anime styled stuff, so it would have just been "meh". It would have lost its impact! That's the RISK you run if you take forever, especially if your ideas are NOT new and groundbreaking. If you're doing something that capitalizes on CURRENT trends then you better get that thing out FAST! Because its time will pass very soon.

If you're behind the times then no rush, because its time has already passed. If you're ahead of the game, you have a little more time, but don't lag too much or else the mainstream, the mediocre middle, will catch up to you and steal your thunder.

So think about all that when coming up with your quotas. How many years do you think your film will have its maximum impact for? Are there other films coming out in the future that are like yours or could steal its fire? Then you better BUST and GRIND to get it done before them or come up with a new idea that gives you more time. When working on HSM, I've already seen a few projects that show me that a part of the vibe/style I'm pushing in HSM and it will creep closer to the mainstream in the coming years, so for me to thrive and survive I need to beat them to the punch!

So production is very systematic for me. It feels like I am a machine completing these tasks everyday, it feels like work. Some days I'm not inspired at all or feel crappy, but I know all I have to do is complete that daily quota and I'm good and still on track. Without a quota there's a lot of fear. "WILL I FINISH ON TIME?! OMG AM I FALLING BEHIND?!" These thoughts don't exist if you've broken your work down properly and have a daily quota.

So with HSM I figured out amongst those 45 sequences that there were 1600 shots and I knew I wanted to do it in a year. So 1600 divided by 365 is 4.5, so I knew that if I animated 4.5 shots a day I could complete it all in a year. Granted there are those few days each month for prep and error correction, so I pushed the quota up to 5 shots a day for a year. I had already done some testing, plus I had my experience working on WATS and 5 shots a day didn't sound scary or intimidating at all. "I COULD DO THIS!" I said to myself. It was no longer a moose, it was a bunch of little sandwiches.

Compete Against Yourself:

I'm a VERY competitive person and I've turned this competitive nature against myself to get more work done. I would compete against myself to see how many shots I could do every day, every week, every month and I knew any shots I did over my quota would mean that I could afford to take days off, or even short vacations, because I would still hit my deadline. This takes much of the stress away from production. It allows you to focus solely on the shots you have to do that day and ignore the rest. Five shots of stress a day isn't too bad, then when those shots are done THE STRESS IS GONE, since you know you're on track to hitting your goal and finishing on time.

So one of the keys to my productivity is creating daily quotas. The other part is the constant evaluations, the constant auditing. Every few weeks I will count the number of shots I've completed and how many need to be done to figure out where I am in the production. By setting the quotas, you know where you want to go and by constantly evaluating your progress, you know where you are at that point in time. These two things are KEY to actually getting there. It's too easy to lose track of where you are in production, so I'm always looking at the calendar and

figuring out when I'm going to complete certain sequences. For example if I took longer than I had planned on Sequence 2, then I have to shift the dates for the other coming Sequences and perhaps even up some of their quotas to make up for lost time. I might even have to cut some scenes out entirely. Finishing the film is a WAR and you're going to have some losses, but the only thing you care about is keeping the majority of your troops alive and winning the war. Because it's all about winning the war and completing the film. In the end no one will care how hard you tried or how hard you worked, how much you cried and complained. If you don't finish, no one will care at all. Even if you do finish it, people don't care about the details, they care about the film and what's IN IT. What happens outside of the film is none of the audience's business and they don't care. All that matters is what is up ON THE SCREEN. When you take this perspective it's easier to make the sacrifices required to complete the film.

Now I know that not everyone can dedicate all their time to making their film like I do. Let's say you worked full-time and only had 4 hours you could work per day, instead of the 8 hours I do. Then it would take you twice as long, so two years to complete animation production on a feature film. That isn't not so bad, eh? Some people may be saying "If I work full time and work on my film 4 hours a day, every day, I won't have time to have a life!" I would argue that passion knows no bounds and if you stay connected to those strings, you will have the energy and willpower you need to make it happen. But it's clearly NOT FOR EVERYONE. You have to be HARDCORE and the truth is most people are WEAK-WILLED, they're WIMPS. So if you're a weak-willed wimp don't even try it, because you will fail. Stick to playing on Facebook or something, cause Uberecting is not for you, it's the ultimate creative challenge. If that gets your blood pumping, maybe it's for you?

Asset Management:

Workflow and asset management are not "sexy" topics, but they are essential if you want to complete big projects. As far as backups go, I follow this guideline: backup as often as you can afford to lose data. So if you'll be okay with losing a weeks worth of work, then backup once a week. If you don't even want to lose a day's worth of work, then backup every day. When animating, I back up everyday. I use a program called "Allway Sync". After each day of work I plugged in an external drive, then ran the "Allway Sync" jobs I had setup to backup my 3d project files, BOTH for the assets and the shots themselves. I didn't lose any data through the whole production and my backups saved me three times, after I accidentally deleted elements and saved some project files that I needed later. Backup is something people don't think about until something goes wrong and they go "OOPS, I should have backed up!" That's very amateurish. If you're working towards a deadline, you need a backup solution. Hard drives have never been cheaper, so just get into the habit of doing it every day.

In the making-of chapter I talked a bit about how I manage my 3d assets, wherein I break them into categories and use Cinema 4d's content browser to access it all. These are the categories I used for my 3d assets:

For the actual C4d project files: My media drive: 3d_shots/Sequences/Sequence01

For my 3d assets I used the following categories inside of an HSM folder:

Characters, Masks, Props, Sets, Interior Objects, Exterior Objects, Materials, Other, Tests

Characters: The rigged character models that were used in the film were in here, so I could just drop them into a scene and go to work.

Masks: These were all the finished Masks for the film. I sometimes swapped them out on the finished characters, so I needed access to them.

Props: Things like swords, guns, candles, fans, umbrellas, working doors, etc. Usually things that would be handled by the characters, or were used interactively by the characters.

Sets: These were the completed, lit sets ready for production, so when I would start a new sequence, I would open the set file, drop the characters and props in and get to work.

Interior Objects: These were the objects I used when laying out an interior scene. Tables, lanterns, lamps, walls, etc.

Exterior Objects: These were the objects I used when laying out an exterior scene. Trees, statues, stones, hills, etc.

Materials: This is where I kept all my custom materials. The content browser displayed rendered thumbnails, so it was easy and fast to search through the materials.

Other: These were special FX files and other weird things like sword sparks, blood FX, shatter FX stuff. I also saved my custom camera and lighting setups in here.

Tests: If I had to use a new technique, I would create a new project file and create the test there, so these were the project files for those. This folder was used a lot. Say, for example, I needed to shatter a mannequin and run a dynamics sim. That file would be saved here. I also saved special Xpresso setups I made in here.

Modular Approach:

It's all about having a modular approach. You're creating all these separate 3d elements that you can simply plug into your scenes, so you create your own camera/lighting rigs. I also saved my own render setting for "preview" renders and "Final renders", so that I could easily switch between the two when working. Another important part of my workflow, that I mentioned in the Making-of section, was that I always had Abobe Bridge open whilst animating and whenever I finished a shot, I would render out a still or two from it and place that into a sequence folder that was opened in Bridge. That way, when I finished animating the film, I could look through the entire film in still form. It's sort of like a rendered storyboard. This was ESSENTIAL because when I was setting up a new shot, I would look at the previous shots so that I could maintain a good visual flow. I had the physical storyboards on hand as well, but the final renders usually

deviate from the storyboards and it's great to see the final look. Also, let's say you were working on a shot and you decided you wanted the lighting setup, or even the same character animation from an earlier shot, you would just look through the sequence stills in Bridge and find the appropriate shot and load it up. Grab what you need out of it and go. I didn't do this on WATS, but it was a huge help with HSM and I will do this from now on.

It's really tough to find this kind of in-depth production info, just like it's really difficult to find video or screen capture vids of an animator actually animating a 3d shot for production. I've done my best to write about workflow here and I will be creating in-depth production videos as well.

So the key is to run tests, do projections, break the large tasks into smaller more manageable ones, create quotas, constantly re-evaluate, constantly audit whilst never getting lost in the process, always making sure you know where you are and then grinding and grinding every day, like a professional, until its done. Once you figure out the problem solving part, it's a very simple process. Creating the film might be complex, but it is simple to understand in terms of workflow: If I do X task for Y days it will be done on Z date.

Troubleshooting:

One thing I didn't mention was the hardware and software problems that will probably happen at some point. The key with hardware is to make sure your system is solid by installing as little as possible. Keep your install as simple as possible and ONLY install the applications you will use for production. During production the only things I had installed were Cinema 4d, After Effects, Photoshop, Bridge and Allway Sync. Once your hardware setup is working well, LEAVE IT ALONE! Don't upgrade anything in the middle of production, UNLESS it's something that will lead to a HUGE performance gain. If you're a hardware geek, you have this thing where you want to constantly upgrade and tweak your machine, but by doing so you're asking for tons of problems. I've realized that these extreme PC tweakers don't really do much work on their PCs, they just run benchmarks, play games and play on the internets. You've got serious work to do so don't fuck with your PC! Since OpenGL is affected a lot by single core cpu speed, overclocking can potentially add a fair amount of performance with little risk, if you know what you're doing and don't ask for too much. Cinema 4d uses OGL, so I ran my i7 920 at 3.4ghz. This added a nice viewport display performance kick and didn't hurt stability. However KNOW that hardware problems will come about, especially if you're running and managing a render farm. Have spare fans, SATA cables and the like on hand. I'm not going to write much about setting up a render farm because the technology moves so fast, but when putting one together, go for the biggest bang for the buck, whilst considering the power cost, as well as the heat/noise issue. I also believe in having more machines with less cores per box than one MEGA server box with hella cores. The law of diminishing returns hurts the "render farm in a box" performance and if that one box has problems or goes down you can't render. I think the perfect number of render boxes is four. I had four render boxes for HSM as well as WATS. On WATS I had four single core 3ghz

boxes with 1gb ram. On HSM I had four Quad core 3.4ghz boxes with 8gb ram. I suspect that on my next film I'll have four eight or sixteen core boxes with 16-32gb of ram OR I might even use the same boxes I used on HSM. Your render farm can be as modest or as powerful as you need for your visual style. If the visual style/resolution/quality setting you choose on your film can be rendered with your single workstation, great! If it can keep up with your daily output of shots animated, that's perfect! So only scale it up in power, as you need it! If I had sixteen quad core boxes for HSM they would be doing nothing most of the time because those four boxes kept up with my output perfectly. An Uberector's fantasy would be to have a crowd renderer, something like the Seti thing where you wouldn't need a render farm at all, your audience could simply lend you their cpu power. Because of bandwidth limitations this isn't practical as of 2011.

So cpu power is definitely a concern. You may be able to animate 200 shots a month, but what if it takes 12 months to render it all? You have to find a good balance, so that you can render in a timely manner, with a level of quality you're happy with. I don't like the look of GI and I didn't use any on HSM. If I would have tried to use GI, my render farm wouldn't have been able to keep up. Things like scene ambient occlusion or SSS look great, but the render hit isn't worth it. No one is going to watch your film for the great AO or SSS, so focus on the story and characters, then move on! Remember that there are no render quality or even animation "standards", besides the ones you apply to your own work. In 3d circles people usually talk of "Pixar Quality" and it's a ridiculous notion. Audiences don't give a fuck about "Pixar Quality", only other 3d geeks do. If you make a great film with your own style people will love it. So if you're saying to yourself "I'll make a film when I can make it Pixar Quality!", you're never going to do it. It's just an excuse people use to not do their own thing OR it's used as insult to attempt to put down outsider films. If you listen to Ralph Bakshi speak, he talks about how the same thing went on with Disney back in the golden age of 2d animation. People would put things down if it wasn't "Disney Quality". Disney did great work and Pixar does great technical work. Their films aren't my cup of tea, but I can appreciate them on a technical level. I don't like the style myself, so to me "Pixar Quality" means safe, tame, status quo and that's not where I want to be. So find your inner punk rock spirit! Give the man the middle finger, go DIY and make your film by any means necessary!

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